



# **The Internet and the Consumer Electronics Market**

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# Agenda

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- Consumer Electronics Market Characteristics
- Customer Buying Behaviors
- PC Companies Embrace the CE Market
- DVD Player Anatomy
- CD/DVD PD Primer
- ALi's Vision in CE Market
- Q&A

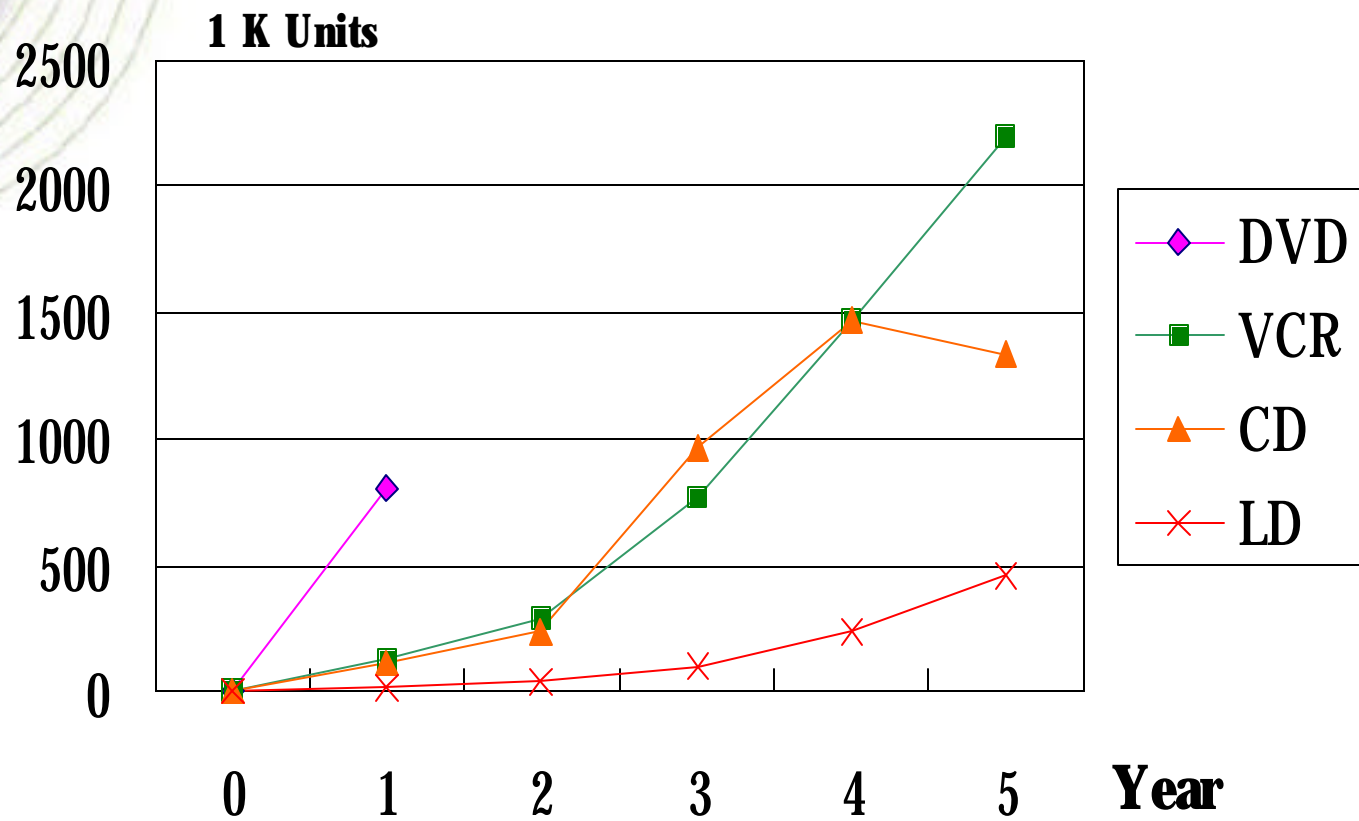


# CE Market Characteristics

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- It takes 10+ years to adapt
- Price points and demographics
- Evolutionary
- Different cost & profit model compares to PC market

# CE Market Characteristics





# Consumer Buying Behavior

- Value
  - Perceived value
- Purchase Decisions
  - One or One+ person buying decision
- Price Points



# What is HOT in the CE Market

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- Digital Audio and Video
  - DVD player, MP3 player, Digital VCR with Time Shift capability(Tivo..)
- Game Consoles
  - PS2, Dreamcast, Nitendo 64
- PDAs
  - Palms, WinCE (iPAQ...)
- DTV, HDTV ?



# PC Companies Embrace CE Market

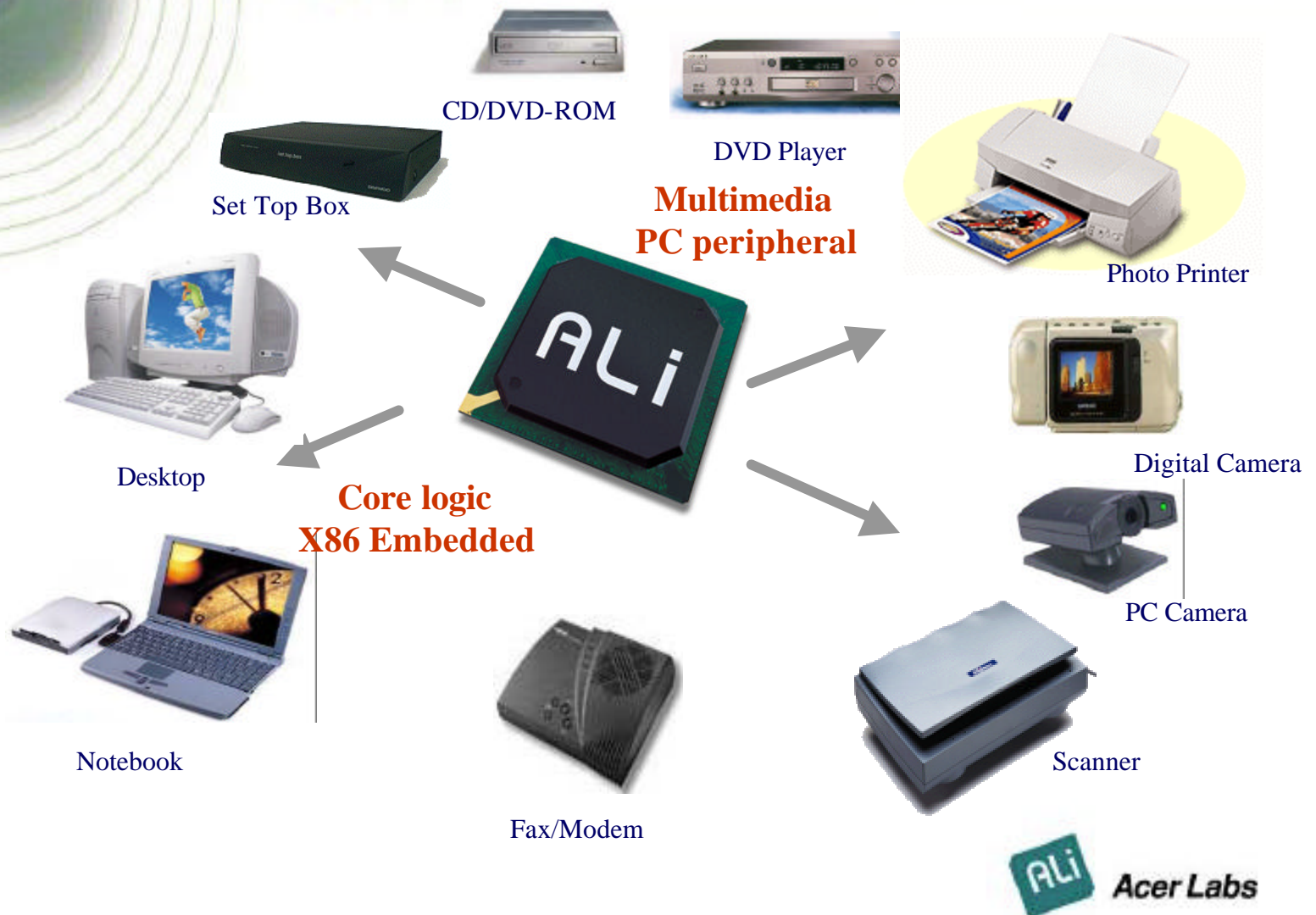
- Microsoft – XBox
- Compaq – iPAQ
- 3COM – Audrey



select one of Audrey's  
features above to learn more.

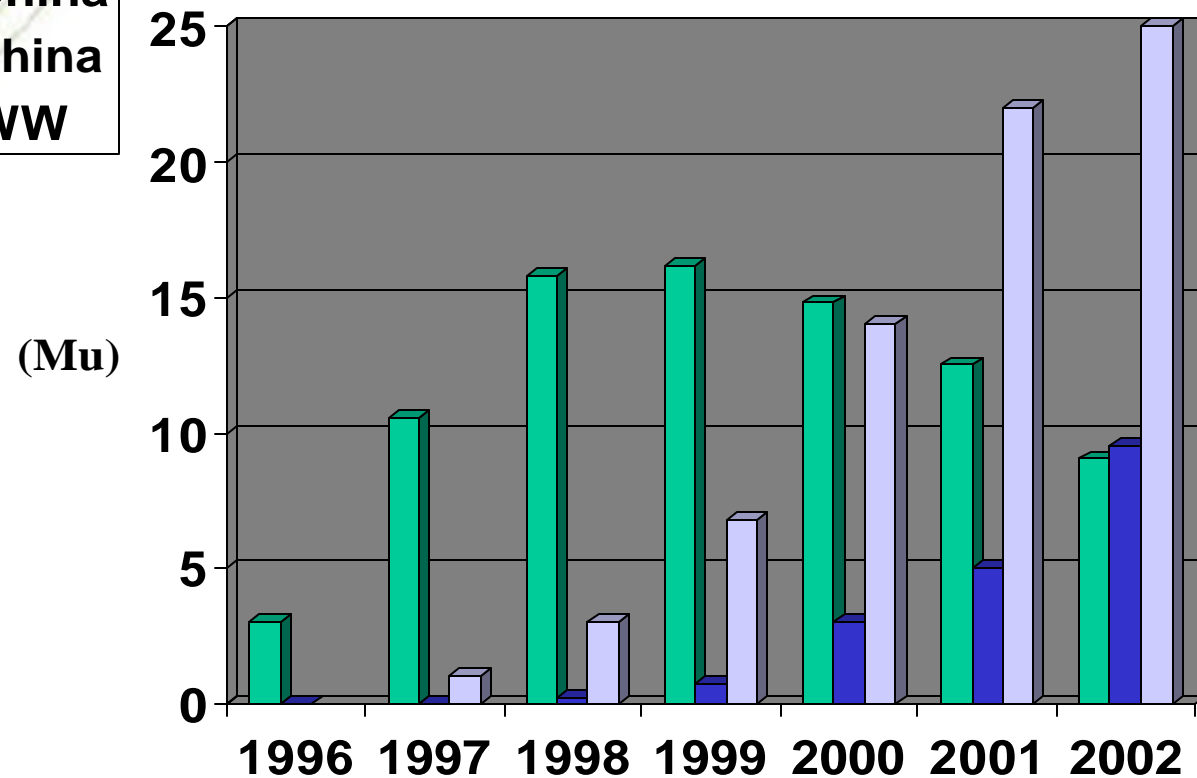
Many more to jump into CE Market

# Product Profile





# VCD/DVD Market & Forecast



Source : In-Stat



# DVD Player Market

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- Supporting CD/VCD/DVD/MP3 playback
- Market with Increasing Volume
  - DVD in China
    - 4 M units produced in China with 5% household penetration in Yr 2000
    - 10 M units by 2002 (Taiwan Electronic News Dec21,2000)
  - DVD in the rest of the world
    - 15 M units by 2002 (In-Stat)



# DVD Player Spec

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- Signal System - NTSC (PAL, SECAM)
- Discs format support
  - DVD-video disc
    - Single-sided, single-layer
    - Single-sided, double-layer
    - Double-sided, double-layer (one layer per side)
  - Compact disc (CD-DA, video CD)
  - MP3 disc
- S-video output (YC signal output)
- Component Video Output (RGB or YPrPb)
- Video signal output: 1 Vp-p (with 75ohm load, sync, negative polarity)



# DVD Player Spec (continued)

- Audio signal output: 200mV rms (1KHz, -20dB)
- Audio signal output characteristics:
  - DVD linear audio
    - Frequency response:
      - 48kHz sampling; 4 Hz to 22 kHz
      - 96 kHz sampling; 4 Hz to 22 kHz
    - S/N ratio: 106dB
    - Dynamic range: 96dB
    - Wow & Flutter: Below measurable limits
    - Total harmonic distortion: 0.003%
- Dolby 5.1 & DTS support

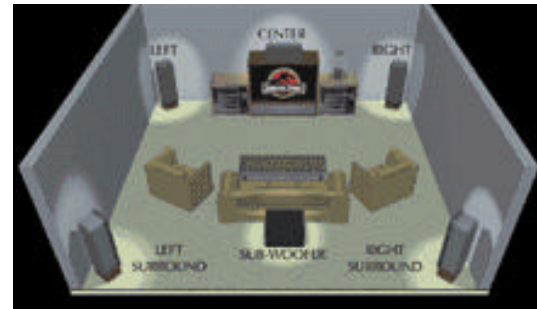


# Inside of a DVD Player

- DVD drive
  - Pickup head assembly; dual lasers – 635nm, 780nm
  - RF AMP
  - Digital processing unit – decode and error correction
  - Buffer memory
  - Embedded micro controller – house keeping
  - Program memory – Flash or ROM
  - Motor control
  - Drive data Interface – ATAPI or others

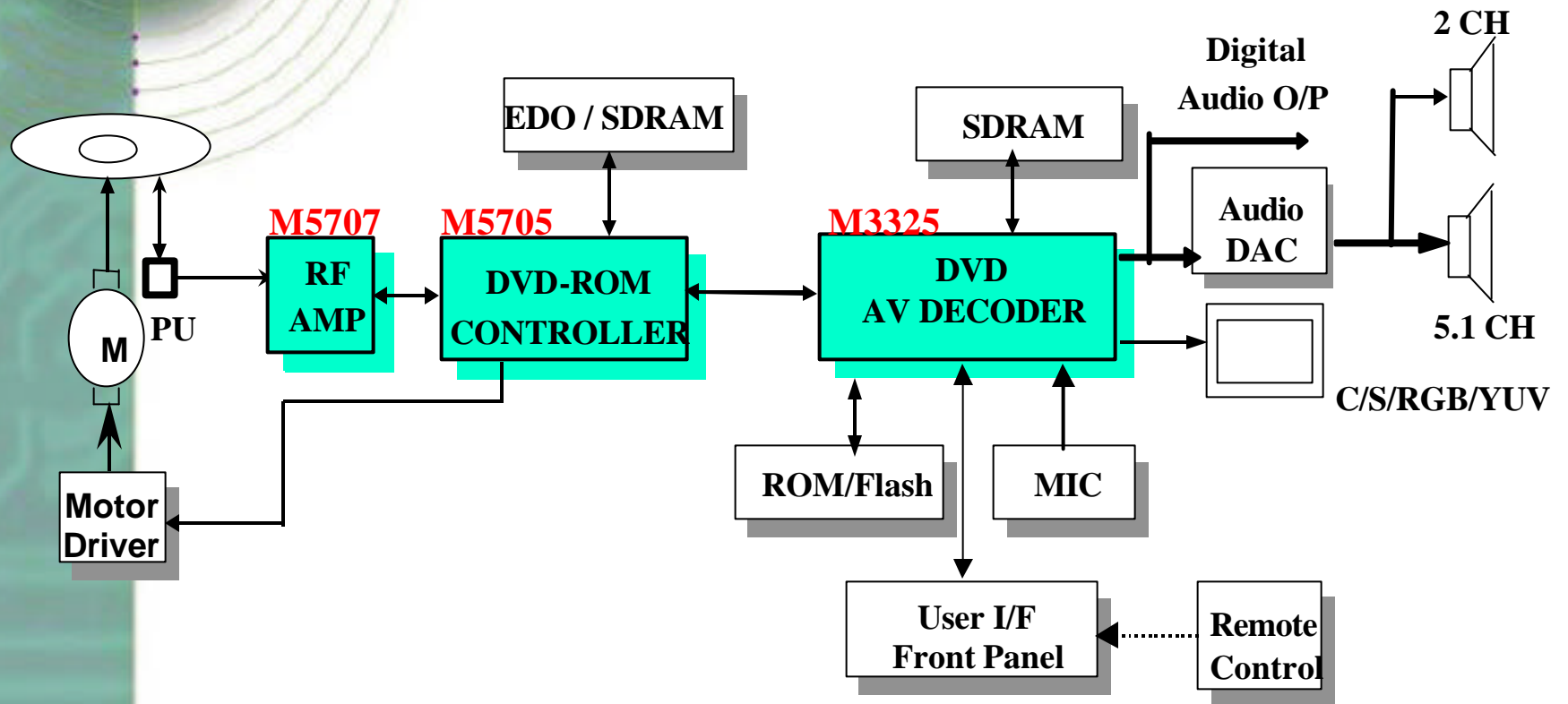
# Inside of a DVD Player

- AV Processor
  - CSS
  - MPEG II video decoder
  - MP3 decoder
  - DSP for Dolby 5.1 and DTS
  - Navigator graphics controller
  - Error concealment
- Progressive Scan processor
- Audio Codec 2 or 5.1 channels
  - 24-bit
- TV encoder
  - Macrovision
- IR remote and panel control





# DVD Player Anatomy

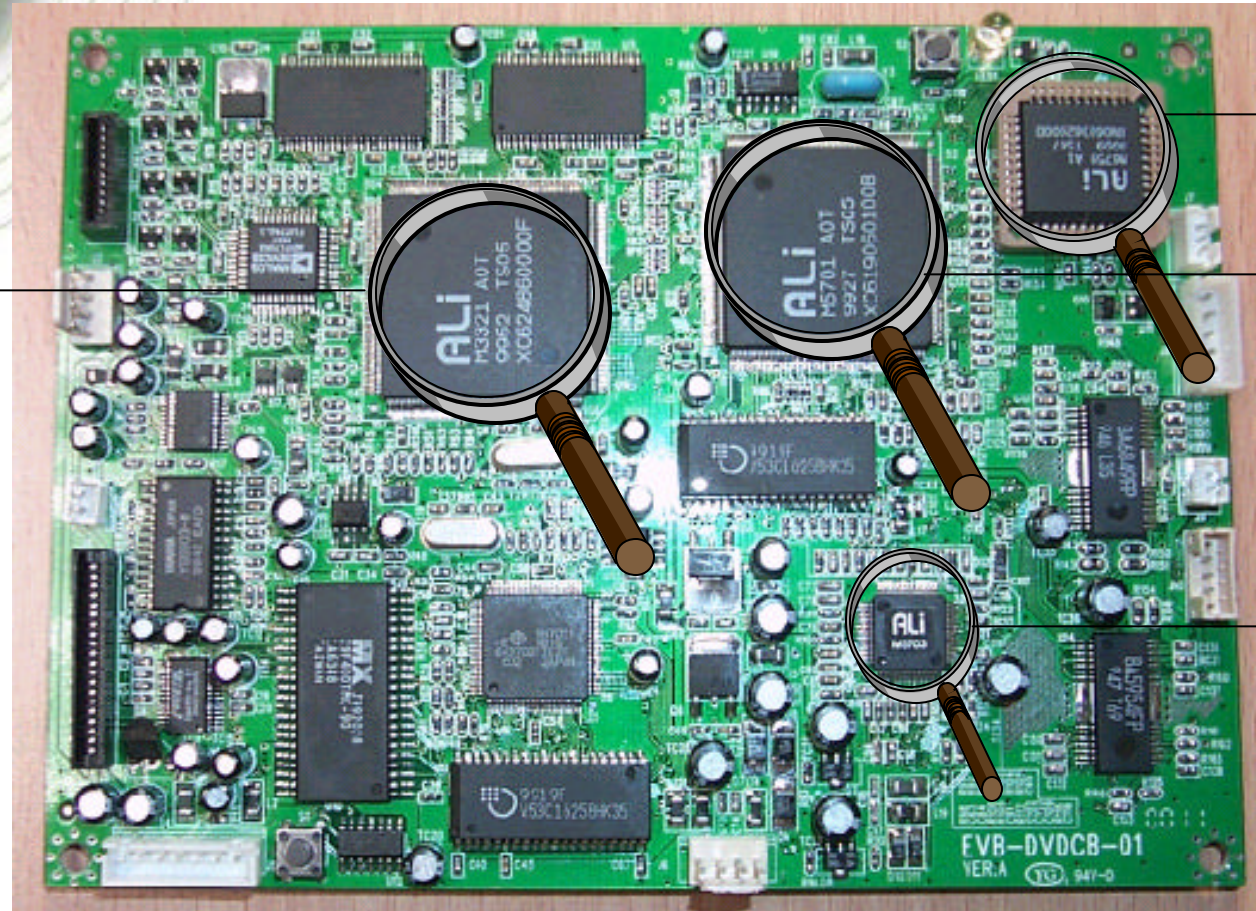


Servo Module

MPEG Module

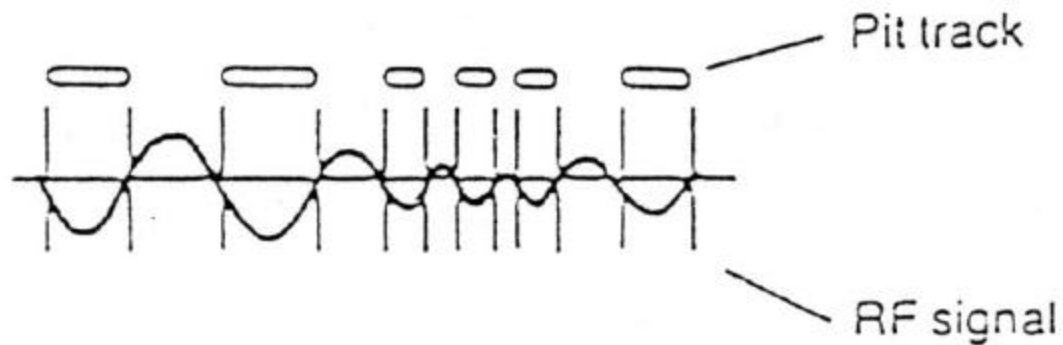
# DVD Player Anatomy

DVD AV  
Decoder



DVD  
Servo

# CD/DVD PD Primer

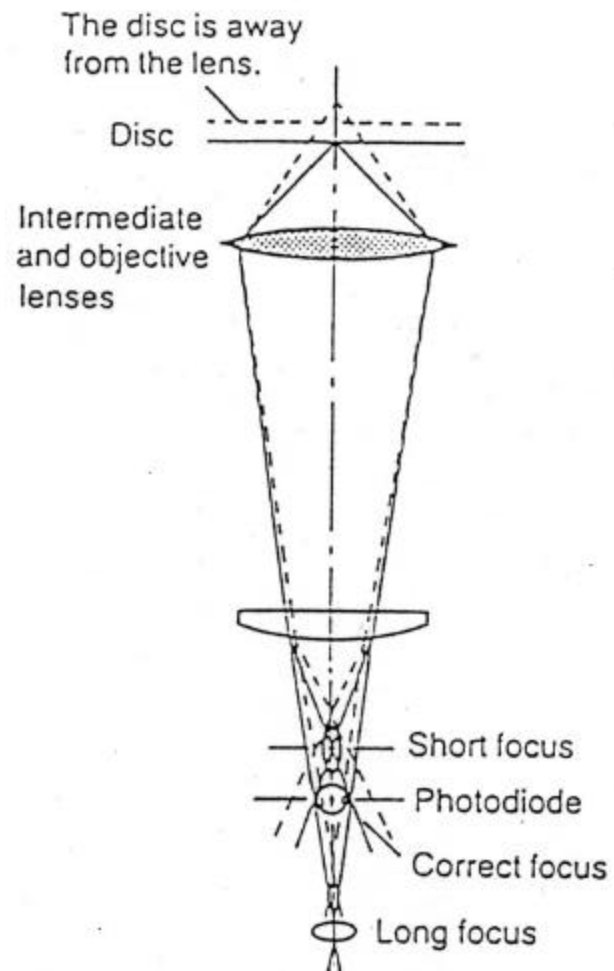


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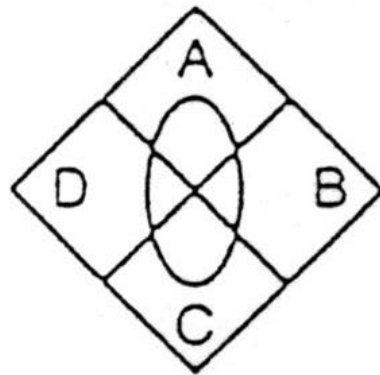
*Data pits are used to produce a representative RF signal.*



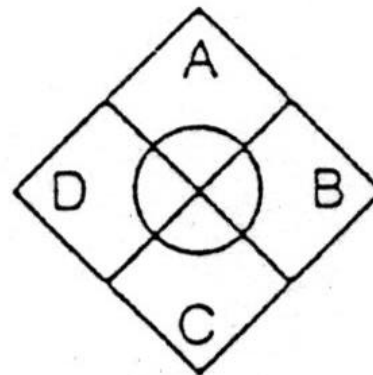
# CD/DVD PD Primer



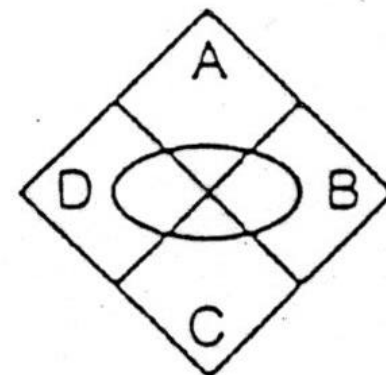
# CD/DVD PD Primer



Disc too near

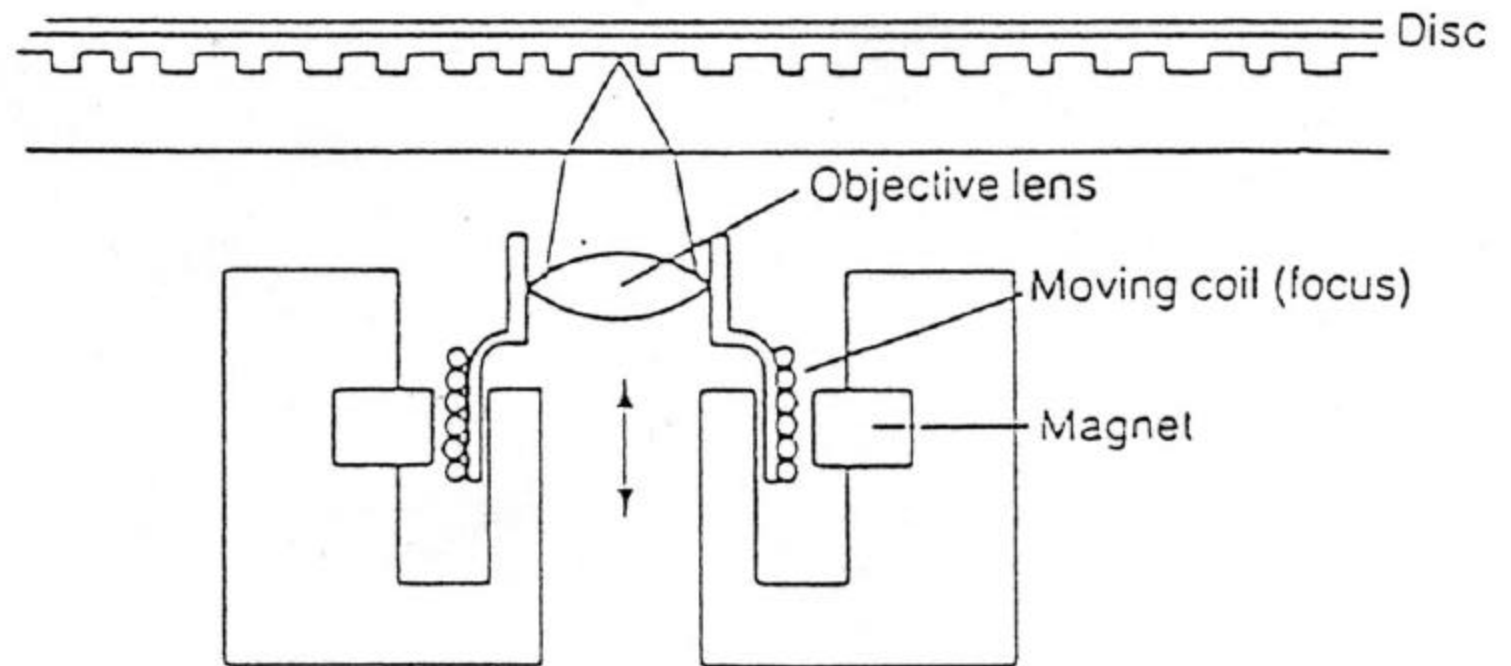


In focus



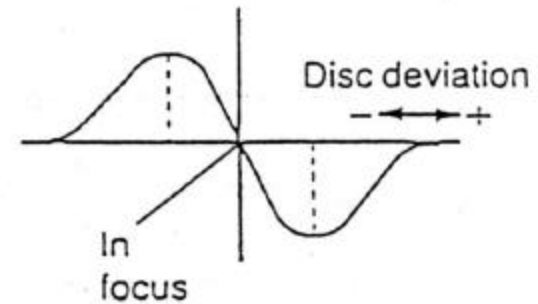
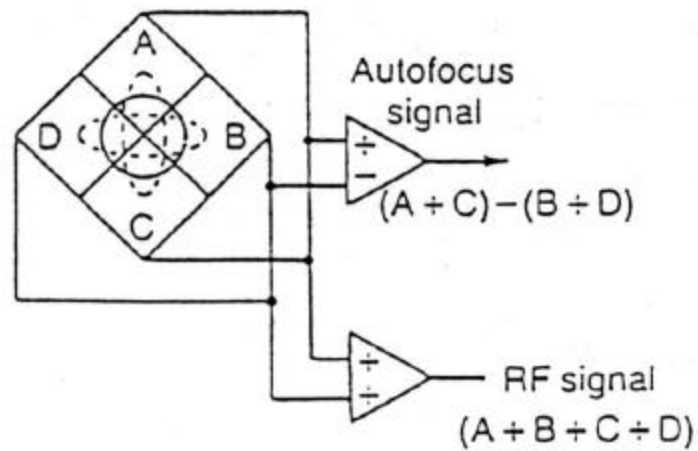
Disc too far

# CD/DVD PD Primer





# CD/DVD PD Primer





# ALi's DVD Chipset Features

- Targeted at DVD Player and DVDROM Markets
  - 20X DVD-ROM and 50X CD-ROM READ
- Built-in high speed read channel circuit
- Built-in high performance digital servo
- Built-in high speed MCU
- Support up to 16Mb DRAM with 16bit bus width.
- Support ATA-100/66/33

# ALi's Vision in CE

- Build products support CE VALUE
- Focus on accepted platform – DVD Player
  - Bring Digital Audio/Video experience and value to our customers



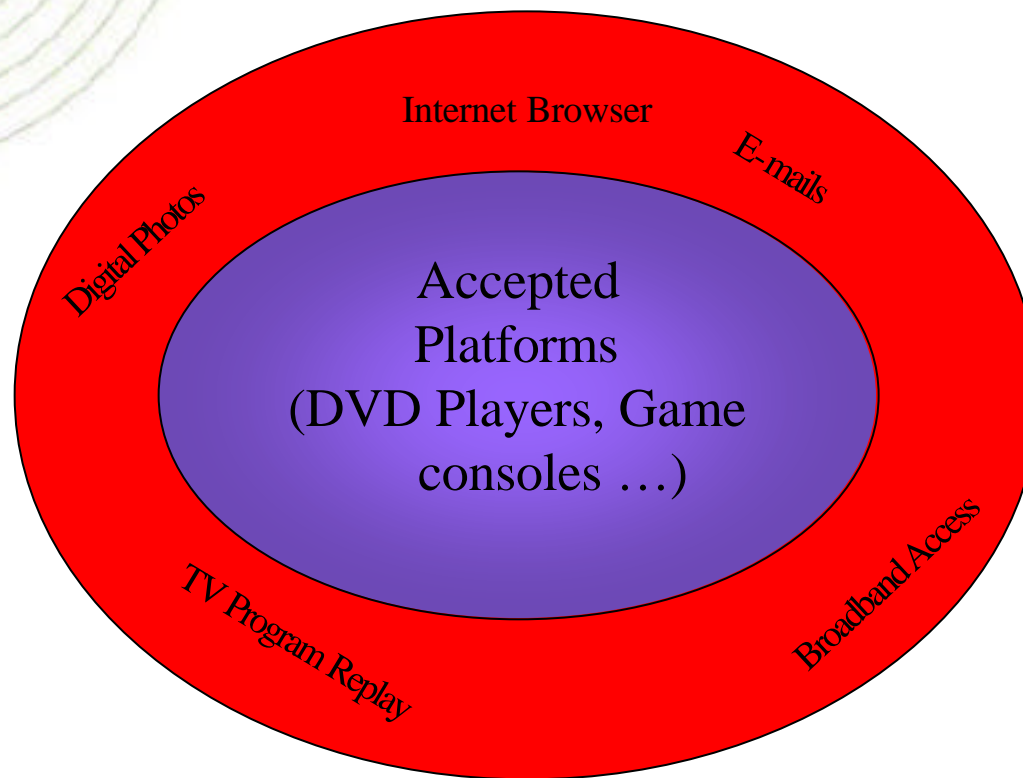


## ALi's Vision in CE (continued)

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- Embraces Internet connection from Digital Video and Audio processing center – the DVD Player
- Integration, Cost Reduction Success factors in CE market
  - Develop CE specific IPs
  - Leverage existing PC IPs
  - Product feature set tailored to address different demographics
- Partnership
  - In both product and IP arenas

# CE and the Internet





# Q&A